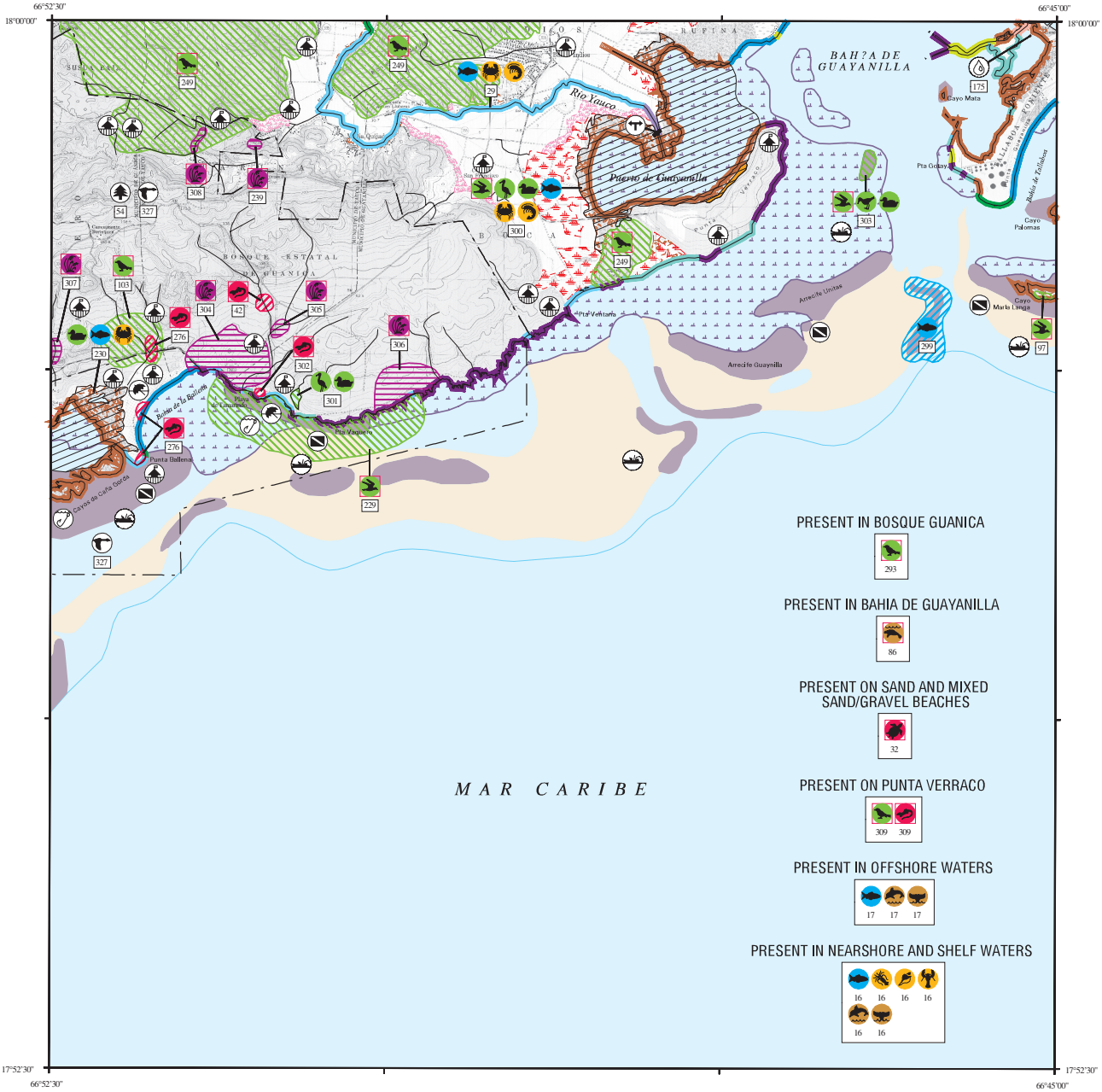
ENVIRONMENTAL SENSITIVITY INDEX MAP



SHORELINE HABITATS (ESI)

- 1A EXPOSED ROCKY CLIFFS
- 1B EXPOSED, SOLID MAN–MADE STRUCTURES
- 2A EXPOSED WAVE–CUT PLATFORMS IN BEDROCK
- 2B SCARPS AND STEEP SLOPES IN MUDDY SEDIMENTS
- 3A FINE– TO MEDIUM–GRAINED SAND BEACHES
- 4 COARSE–GRAINED SAND BEACHES
- 5 MIXED SAND AND GRAVEL BEACHES
- 6A GRAVEL BEACHES
- 6B RIPRAP
- 7 EXPOSED TIDAL FLATS
- 8A SHELTERED ROCKY SHORES
- 8B SHELTERED, SOLID MAN–MADE STRUCTURES
- 9A SHELTERED TIDAL FLATS
- 9B SHELTERED VEGETATED LOW BANKS
- 10D MANGROVES
- SALT– AND BRACKISH–WATER MARSHES
- FRESHWATER MARSHES
- FRESHWATER SWAMPS
- FRESHWATER SCRUB/SHRUB

STREAM REACHES (RSI)

- 1 QUIET POOL; LOW–SENSITIVE BANKS
- 2 STRAIGHT CHANNEL WITH CURRENTS; LOW–SENSITIVE BANKS (MUD DOMINANT)
- 3 MEANDERING CHANNEL; SAND POINT BARS
- 4 MEANDERING CHANNEL; VEGETATED POINT BARS
- 5 RAPIDS OVER BEDROCK
- 6 MEANDERING CHANNEL; SAND AND GRAVEL POINT BARS
- 7 SPLIT CHANNEL WITH COARSE GRAVEL; SOME RAPIDS
- 8 SMALL FALLS; BOULDERS IN CHANNEL
- 9 LARGE FALLS; BOULDERS IN CHANNEL
- 10 CHANNELS WITH ASSOCIATED VULNERABLE WETLANDS
- KARST

N W E S

SCALE 1:55000

1 .5 0 1 KILOMETER

1 .5 0 1 MILE

Not For Navigation
Published: May 2000

Published at Seattle, Washington
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Hazardous Materials Response Division

PUNTA VERRACO, P.R. (1982) PR-58

PUERTO RICO - ESIMAP 58

BIOLOGICAL RESOURCES:

BIRD:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting
97	Brown pelican	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	-
103	Yellow-shouldered blackbird	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	MAR-SEP
229	Brown pelican	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	-
230	Waterfowl				X	X	X	X	X	X	X	X	X	X	X	X	-
249	Puerto Rican nightjar	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL
293	Key West quail-dove				X	X	X	X	X	X	X	X	X	X	X	X	FEB-AUG
	Mangrove cuckoo			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUN
	Neotropical migrants			HIGH	X	X	X	X						X	X	X	-
	Puerto Rican bullfinch			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUN
	Puerto Rican lizard-cuckoo			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC
	Puerto Rican nightjar	S/F	E/E	HIGH	X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL
	Yellow-billed cuckoo			HIGH			X	X	X	X	X	X					APR-JUL
300	Brown pelican	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	-
	Wading birds			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-
	Waterfowl			LOW	X	X	X	X	X	X	X	X	X	X	X	X	-
301	Blue-winged teal			MEDIUM	X	X	X	X						X	X	X	-
	Wading birds			HIGH	X	X	X	X	X	X	X	X	X	X	X	X	-
303	American oystercatcher				X	X	X	X	X	X	X	X	X	X	X	X	-
	Least tern	S	T					X	X	X	X	X					APR-JUL
	Roseate tern	S/F	E/T					X	X	X	X	X	X				MAY-JUL
	Sandwich tern				X	X	X	X	X	X	X	X	X	X	X	X	MAY-JUL
	Seabirds				X	X	X	X	X	X	X	X	X	X	X	X	-
	Shorebirds				X	X	X	X	X			X	X	X	X	X	-
	White-cheeked pintail				X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUN
309	Puerto Rican nightjar	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	FEB-JUL

FISH:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
16	Pelagic fish				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC
	Reef fish				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC
17	Pelagic fish				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC
29	Native stream fish				X	X	X	X	X	X	X	X	X	X	X	X	APR-MAY AUG-NOV	APR-MAY AUG-NOV	APR-MAY AUG-NOV	JAN-DEC	JAN-DEC
230	Nursery fish				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	JAN-DEC	-
	Snook				X	X	X	X	X	X	X	X	X	X	X	X	APR-FEB	APR-FEB	JAN-DEC	JAN-DEC	JAN-DEC
	Tarpon				X	X	X	X	X	X	X	X	X	X	X	X	-	-	MAY-DEC	JAN-DEC	JAN-DEC
299	Red hind			HIGH	X	X	X								X	X	JAN-MAR	JAN-MAR	JAN-MAR	-	DEC-MAR
300	Native stream fish							X	X		X	X	X	X			-	-	APR-MAY AUG-NOV	-	-
	Nursery fish				X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	JAN-DEC	-
	Snook				X	X	X	X	X	X	X	X	X	X	X	X	APR-FEB	APR-FEB	JAN-DEC	JAN-DEC	JAN-DEC
	Tarpon				X	X	X	X	X	X	X	X	X	X	X	X	-	-	MAY-DEC	JAN-DEC	JAN-DEC

PLANT:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D
239	Trichilia triacantha	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
304	Mitracarpus polycladus	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
305	Eugenia woodburyana	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
	Ottoschulzia rhodoxylon	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
	Trichilia triacantha	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
306	Mitracarpus maxwelliae	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
307	Eugenia woodburyana	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
	Ottoschulzia rhodoxylon	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
308	Ottoschulzia rhodoxylon	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X
	Trichilia triacantha	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X

INVERTEBRATE:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Spawning	Eggs	Larvae	Juveniles	Adults
16	Caribbean spiny lobster				X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC	JAN-DEC
	Octopus				X	X	X	X	X	X	X	X	X	X	X	X	DEC-MAR	DEC-APR	-	JAN-DEC	JAN-DEC
	Queen conch				X	X	X	X	X	X	X	X	X	X	X	X	APR-OCT	APR-OCT	APR-OCT	JAN-DEC	JAN-DEC
29	Freshwater crab				X	X	X	X	X	X	X	X	X	X	X	X	APR-MAY AUG-NOV	APR-MAY AUG-NOV	-	JAN-DEC	JAN-DEC
	Native stream shrimp				X	X	X	X	X	X	X	X	X	X	X	X	APR-MAY AUG-NOV	APR-MAY AUG-NOV	APR-MAY AUG-NOV	JAN-DEC	JAN-DEC
230	Blue land crab				X	X	X	X	X	X	X	X	X	X	X	X	JUL-AUG	JUL-AUG	JUL-SEP	JAN-DEC	JAN-DEC
300	Blue land crab				X	X	X	X	X	X	X	X	X	X	X	X	JUL-AUG	JUL-AUG	JUL-SEP	JAN-DEC	JAN-DEC
	Native stream shrimp							X	X		X	X	X	X			-	-	APR-MAY AUG-NOV	-	-

MARINE MAMMAL:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Mating	Calving
16	Dolphins				X	X	X	X	X	X	X	X	X	X	X	X	-	-
	Whales				X	X	X	X	X	X	X	X	X	X	X	X	-	-
17	Dolphins				X	X	X	X	X	X	X	X	X	X	X	X	-	-
	Whales				X	X	X	X	X	X	X	X	X	X	X	X	-	-
86	West Indian manatee	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC

REPTILE:

RAR#	Species	S/F	T/E	Conc.	J	F	M	A	M	J	J	A	S	O	N	D	Nesting	Hatching	Internesting	Juveniles	Adults
32	Green sea turtle	S/F	E/T		X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	-	JAN-DEC	JAN-DEC
	Hawksbill sea turtle	S/F	E/E		X	X	X	X	X	X	X	X	X	X	X	X	JAN-DEC	JAN-DEC	-	JAN-DEC	JAN-DEC
	Leatherback sea turtle	S/F	E/E			X	X	X	X	X	X	X					FEB-JUN	APR-SEP	-	APR-SEP	FEB-JUN
42	Puerto Rican crested toad	S/F	T/T		X	X	X	X	X	X	X	X	X	X	X	X	MAY-DEC	MAY-DEC	-	MAY-JAN	JAN-DEC
276	Cook's anole	S	T		X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	JAN-DEC	JAN-DEC
302	Puerto Rican crested toad	S/F	T/T		X	X	X	X	X	X	X	X	X	X	X	X	MAY-DEC	MAY-DEC	-	MAY-JAN	JAN-DEC
309	Cook's anole	S	T		X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	JAN-DEC	JAN-DEC

HUMAN USE RESOURCES:

HUN#	Name	Owner/Manager	Contact	Phone
FOREST:				
54	BOSQUE GUANICA	DRNA	DIVISION DE MANEJO BOSQUES ESTATALES	787/721-5495
WILDLIFE REFUGE:				
327	RESERVA NATURAL DE GUANICA	DRNA	DIVISION DE RESERVAS NATURALES Y REFUGIOS DE VIDA SILVESTRE	787/724-2816

WATER INTAKE:

HUN#	Name	Owner/Manager	Location	Phone
175	CORCO FACILITY	CORCO		787/843-3030

Biological information shown on the maps represents known concentration areas or occurrences, but does not necessarily represent the full distribution or range of each species. This is particularly important to recognize when considering potential impacts to protected species.

APPENDIX 3
UNITED STATES FISH AND WILDLIFE SERVICE
Technical Assistance/Guidance Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Boqueron Field Office
Carr. 301, KM 5.1, Bo. Corozo
P.O. Box 491
Boqueron, PR 00622

JUN 30 2010

Mr. Yousev García
Director
Asesores Ambientales y Educativos, Inc.
PMB 145
130 Winston Churchill Avenue
San Juan, Puerto Rico 00926-6018

Re: Via Verde Project (Gasoducto del Sur)
LP-012

Dear Mr. García:

This is in reply to your letter dated June 15, 2010, requesting technical assistance in form of a list of federally listed species and designated critical habitat along the proposed alignment of the Via Verde Project, previously known as Gasoducto del Sur. Our technical assistance is preliminary since the only information provided consists of a reference map of the pipeline route in Google Earth format. The information does not provide detailed description of the project and the areas needed for access roads during construction, transit areas for vehicles, storage areas, construction facilities, among other components associated to infrastructure projects.

Based on the provided alignment, suitable habitat for the following federally-listed species may be affected.

Dry limestone hills from Guayanilla to Ponce:

1) *Ottoschulzia rhodoxylon* (palo de rosa)
2) *Trichilia triacantha* (bariaco)
3) *Buxus valhii* (diablito de tres cuernos)
4) *Eugenia woodburyana*
5) *Catesbaea melanocarpa*
6) *Cordia rupicola*
7) *Mitracarpus maxwelliae*
8) *Mitracarpus polycladus*
9) *Caprimulgus noctitherus* (guabairo)

Central Mountain Range (Volcanic):

1) *Thelypteris inabonensis*
2) *Thelypteris yaucoensis*
3) *Thelypteris verecunda*

4) *Juglans jamaicensis* (nogal)
5) *Polystichum calderoense*
6) *Accipiter striatus venator* (falcon de sierra)
7) *Buteo platypterus brunnescens* (guaraguaito)

Moist limestone (Río Abajo Forest and PR 10)

1) *Cordia bellonis*
2) *Ottoschulzia rhodoxylon* (palo de rosa)
3) *Daphnopsis helleriana*
4) *Solanum drymophilum* (erubia)
5) *Pleodendron macranthum* (chupacallos)
6) *Myrcia paganii*
7) *Shoepfia arenaria*
8) *Tectarea estremerana*
9) *Auerodendron pauciflorum*
10) *Buteo platypterus brunnescens* (guaraguaito)
11) *Amazona vittatta vittatta* (cotorra puertorriqueña)

Northern Limestone Hills

1) *Ottoschulzia rhodoxylon* (palo de rosa)
2) *Buxus vahlii* (diablito de tres cuernos)
3) *Banara vanderbiltii*
4) *Cordia bellonis*
5) *Daphnopsis helleriana*
6) *Solanum drymophilum* (erubia)
7) *Myrcia paganii*
8) *Shoepfia arenaria*
9) *Tectarea estremerana*
10) *Auerodendron pauciflorum*
11) *Zanthoxylun thomasianum*
12) *Accipiter striatus venator* (falcon de sierra)
13) *Buteo platypterus brunnescens* (guaraguaito)

Northern Wetlands and White Sands

1) *Stahlia monosperma* (cobana negra)
2) *Chamaecrista glandulosa*

We recommend surveys be conducted by qualified and experienced personnel along the proposed route and adjacent areas. It was our experience with the Gasoducto del Sur that surveys were limited to the footprint of the project, resulting on additional surveys during construction since additional access roads were needed for construction purposes. In addition, when individuals or populations of federally listed species were found, alternative routes to avoid impacts to the individuals / populations were evaluated and surveyed. This approach of limiting the surveys to the footprint of the project resulted in duplication of efforts and delays.

In your letter, you also requested information regarding surveys methodologies for the species. The Service has not developed surveys methodologies for listed species for consultation purposes. However, we recommend the applicant uses the best information available, species expert' opinion, and scientific literature to develop such methodologies. Once the methodologies are developed, the applicant should consult with the Service for review. Based on our experience in previous projects, we do not recommend the establishment of transects to survey listed plants. We recommend that the project area be systematically surveyed by qualified and experienced personnel to search for the listed plant species. Also it was our experience in one of the site visits to the area for the proposed access roads for the Gasoducto del Sur that biologists conducting surveys using transect lines did not detect one additional listed species that we detected during our visit. Regarding the guabairo, we recommend contracting qualified and experienced personnel to identify suitable habitat within the project area and to conduct surveys with playback recordings (playing the recording for 2 minutes and listening for a minimum of 3 minutes) during the appropriate time and date frames (three hours before sunset and three hours after sunset, monthly from March to early July which is the peak of the nesting season). The surveys for the falcón de sierra and guaraguaito should be conducted from November to March following survey methodologists established in Lerandi-Román (2006) and Hengstenberg and Vilella (2004).

Threatened and endangered species and their habitats are protected by both federal and Commonwealth laws and regulations. At the Federal level, the species are protected by the Endangered Species Act of 1973 as amended. Section 7 of the Endangered Species Act requires that Federal agencies ensure the actions permitted, funded, or carried out by that agency will not adversely modify and/or will not jeopardize the continued existence of threatened and endangered species. Section 9 of the Endangered Species Act prohibits take of an endangered species. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Under Section 10 of the Endangered Species Act, the Service can provide incidental take permits (ITPs) pending to permit issuance criteria are met and a Habitat Conservation Plan (HCP) is completed.

With the information available to us at the present time, we cannot determine the extent of involvement by other Federal agencies with permitting responsibilities for the proposed project nor do we know the extent of the potential impact to protected species. Therefore, we cannot determine if an incidental take permit under Section 10 of the Endangered Species Act is required.

In addition to threatened and endangered species, the Service would like to review the alternative analysis for the proposed project and the possible direct and indirect effects to resources under our jurisdiction such as migratory birds, riparian and wetland resources, and forested habitats.

Our comments are issued as technical assistance as per your request in accordance with the Fish and Wildlife Coordination Act (47 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and in accordance with the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

If you have any questions, please contact Marelisa Rivera, Assistant Field Supervisor for the Caribbean Ecological Services Field Office at 787-851-7297 extension 206.

Sincerely yours,

Edwin E. Muñiz
Field Supervisor
Caribbean Ecological Services Field Office

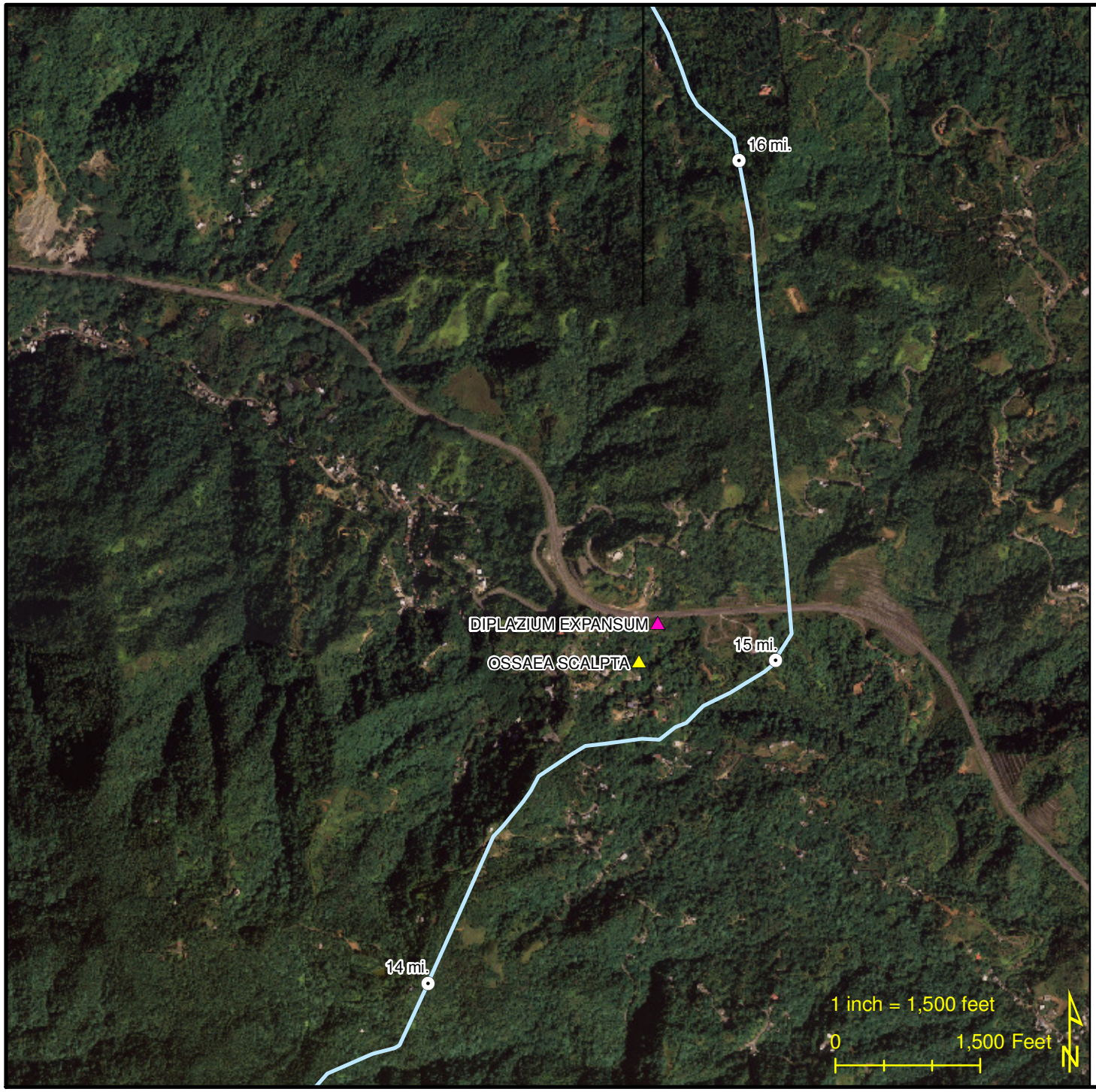
Mtr
Cc: BCPeabody Consulting, PA

Literature Citations:

Hengstenberg, D.W. and F.J. Vilella. 2004. Reproductive biology, abundance, and movement patterns of the Puerto Rican broad-winged hawk in a limestone forest of Puerto Rico. Final report submitted to the U.S. Geological Survey under Cooperative Agreement No. 14-45-009-1543-59.

Llerandi-Román, I.C. 2006. Red-tailed hawk home range, habitat use, and activity patterns in north central Puerto Rico. MS Thesis, Mississippi State University, Mississippi, 173 pp.

APPENDIX 4
Critical Habitat and Wildlife Elements Maps



Via Verde Pipeline Project

Ecoelectrica LNG Terminal to San Juan Power Plant

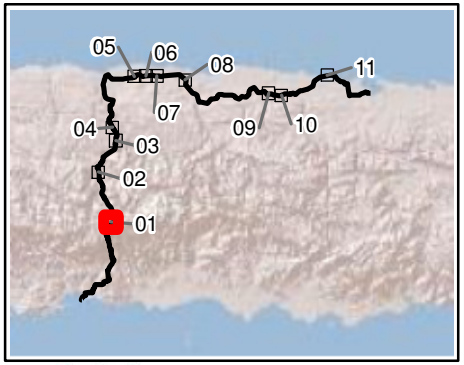
Critical Habitat Wildlife Elements

Map 01

- Mile Marker
- Pipeline
- Critical Habitat

Element Occurences

- DIPLAZIUM EXPANSUM
- OSSAEA SCALPTA



BCPEABODY

Date: Aug 27, 2010

Via Verde Pipeline Project

Ecoelectrica LNG Terminal to San Juan Power Plant

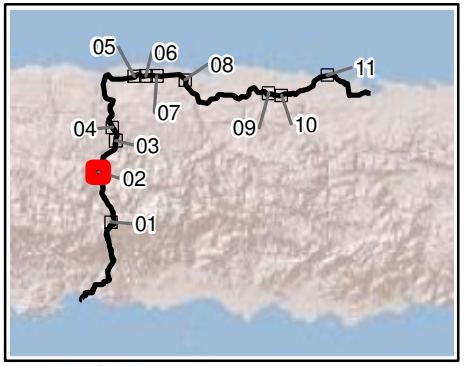
Critical Habitat Wildlife Elements

Map 02

- Mile Marker
- Pipeline
- Critical Habitat

Element Occurences

- BULBOPHYLLUM PACHYRRACHIS



BCPEABODY

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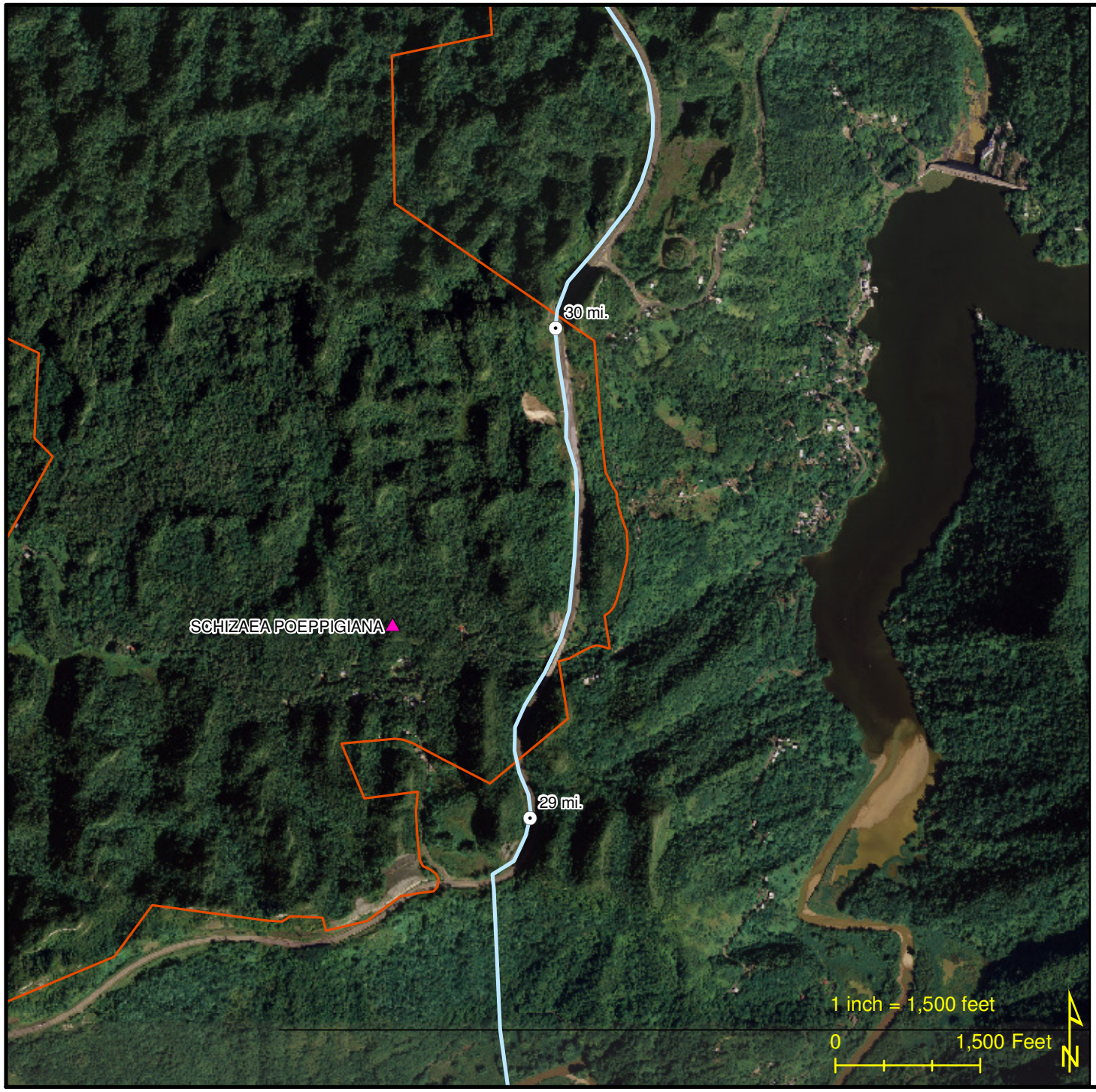


Via Verde Pipeline Project

Ecoelectrica LNG Terminal to San Juan Power Plant

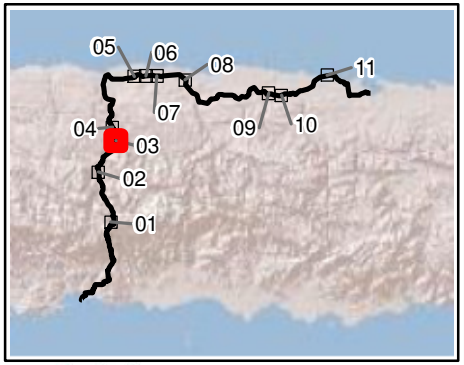
Critical Habitat Wildlife Elements

Map 03

- Mile Marker
- Pipeline
- Critical Habitat

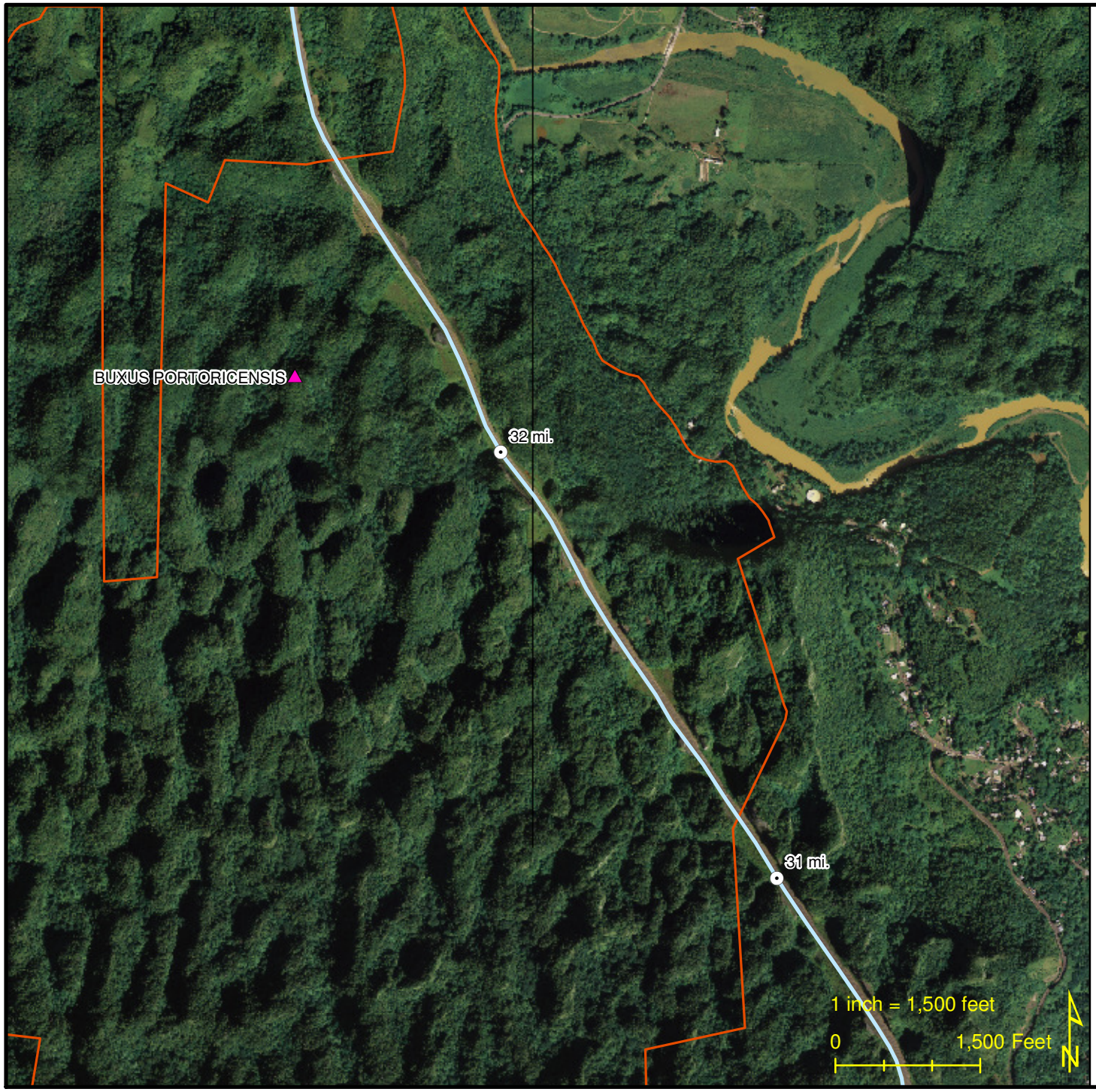
Element Occurences

- SCHIZAEA POEPPIGIANA



BCPEABODY

Date: Aug 27, 2010



Via Verde Pipeline Project

Ecoelectrica LNG Terminal to San Juan Power Plant

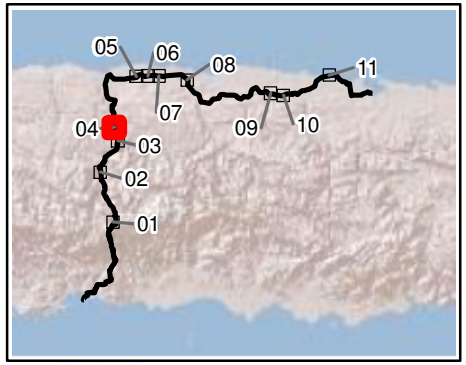
Critical Habitat Wildlife Elements

Map 04

- Mile Marker
- Pipeline
- Critical Habitat

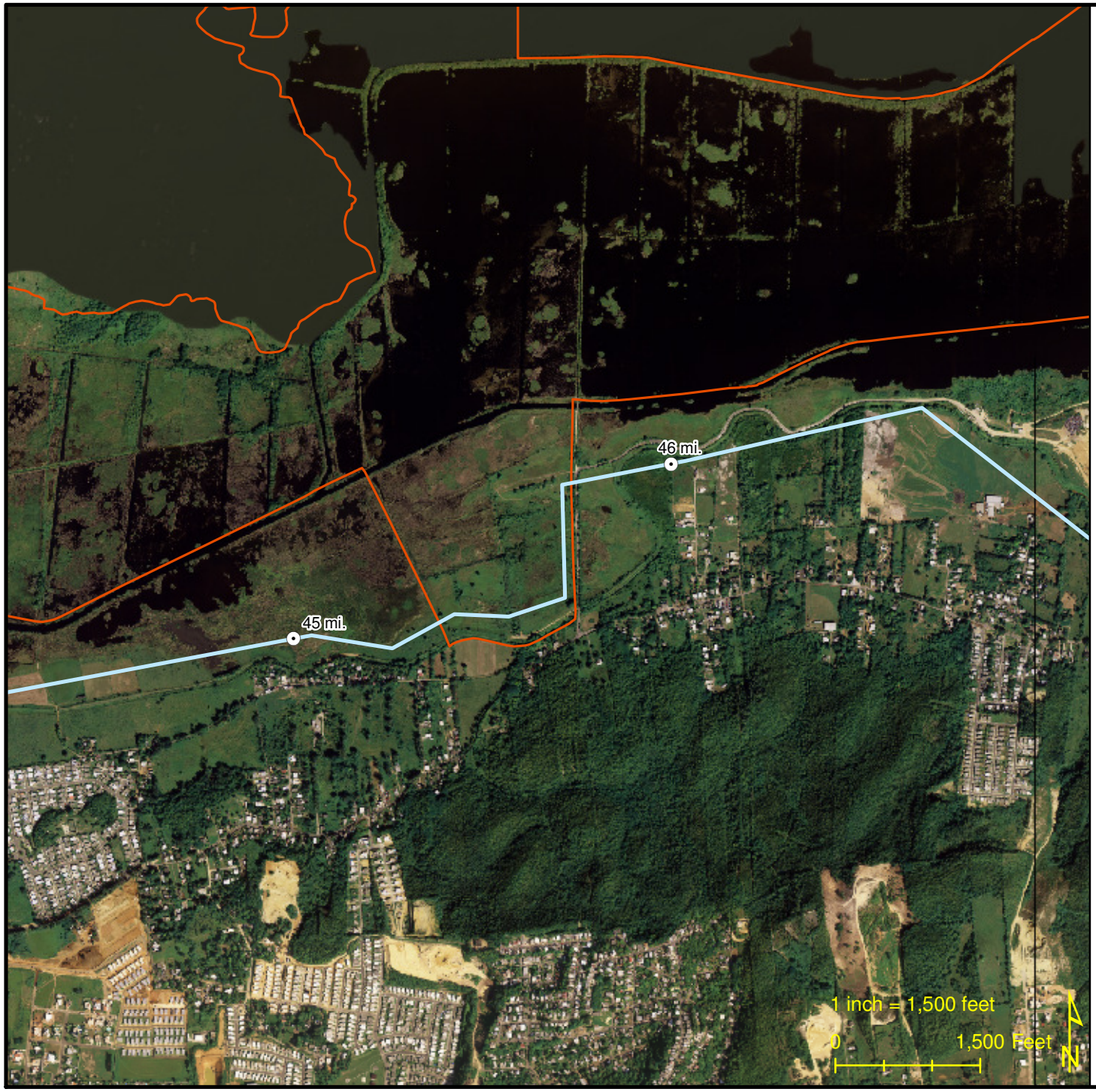
Element Occurences

- BUXUS PORTORICENSIS



BCPEABODY

Date: Aug 27, 2010



Via Verde Pipeline Project

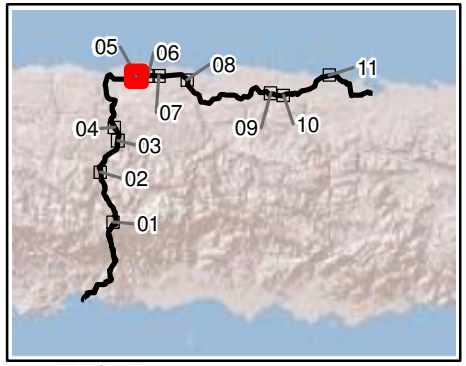
Ecoelectrica LNG Terminal to San Juan Power Plant

Critical Habitat Wildlife Elements

Map 05

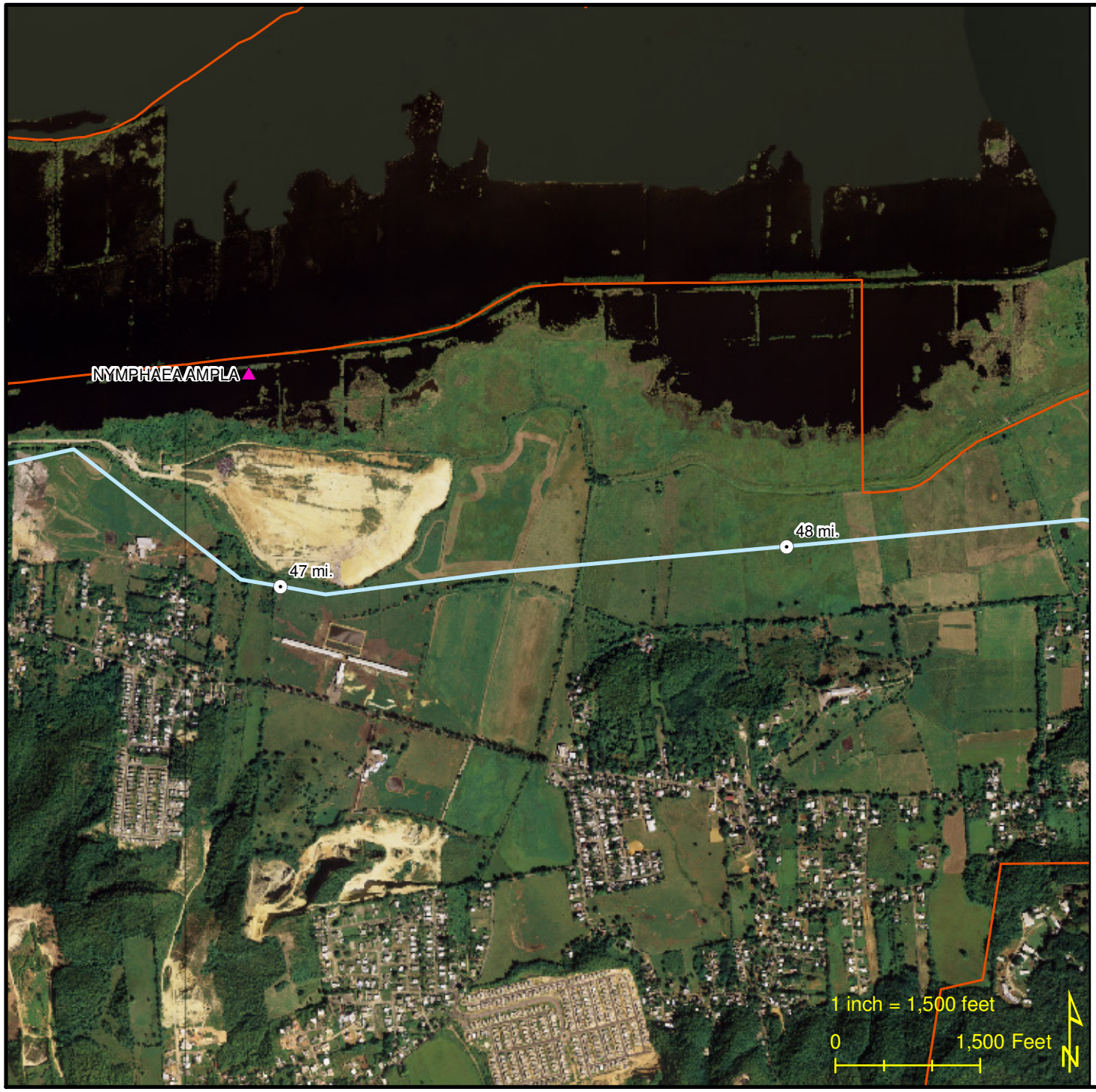
- Mile Marker
- Pipeline
- Critical Habitat

Element Occurences



BCPEABODY

Date: Aug 27, 2010



Via Verde Pipeline Project

Ecoelectrica LNG Terminal to San Juan Power Plant

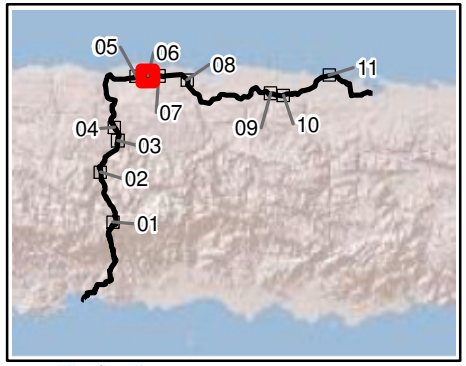
Critical Habitat Wildlife Elements

Map 06

- Mile Marker
- Pipeline
- Critical Habitat

Element Occurences

- NYMPHAEA AMPLA



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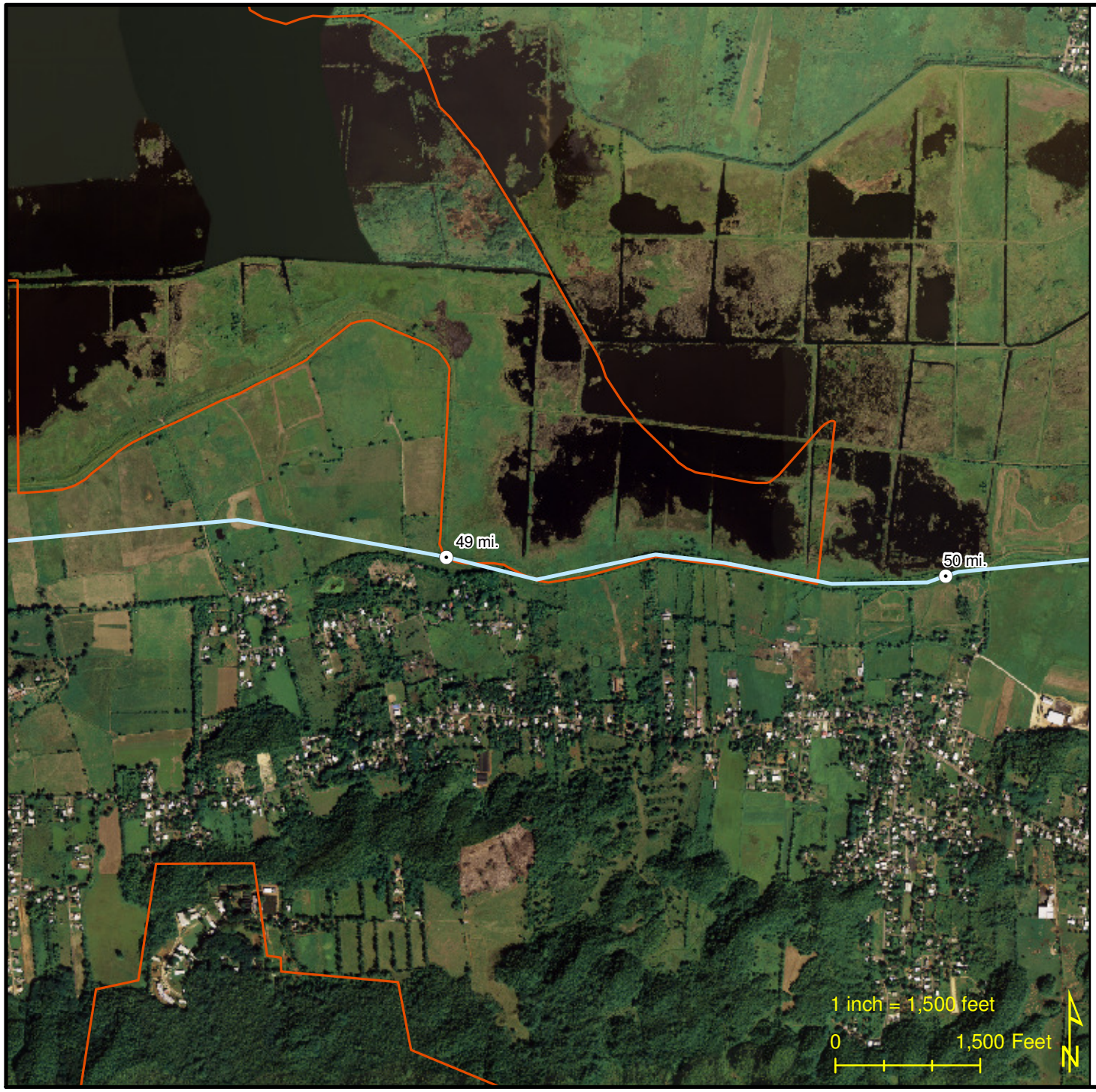


Via Verde Pipeline Project

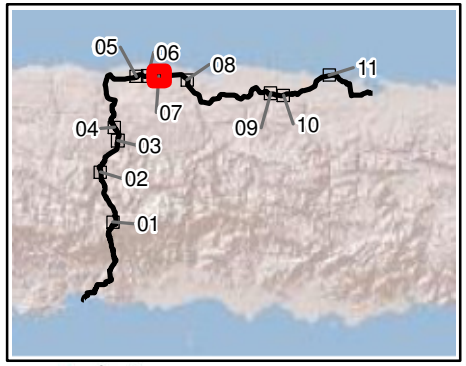
Ecoelectrica LNG Terminal to San Juan Power Plant

Critical Habitat Wildlife Elements

Map 07

- Mile Marker
- Pipeline
- Critical Habitat

Element Occurences



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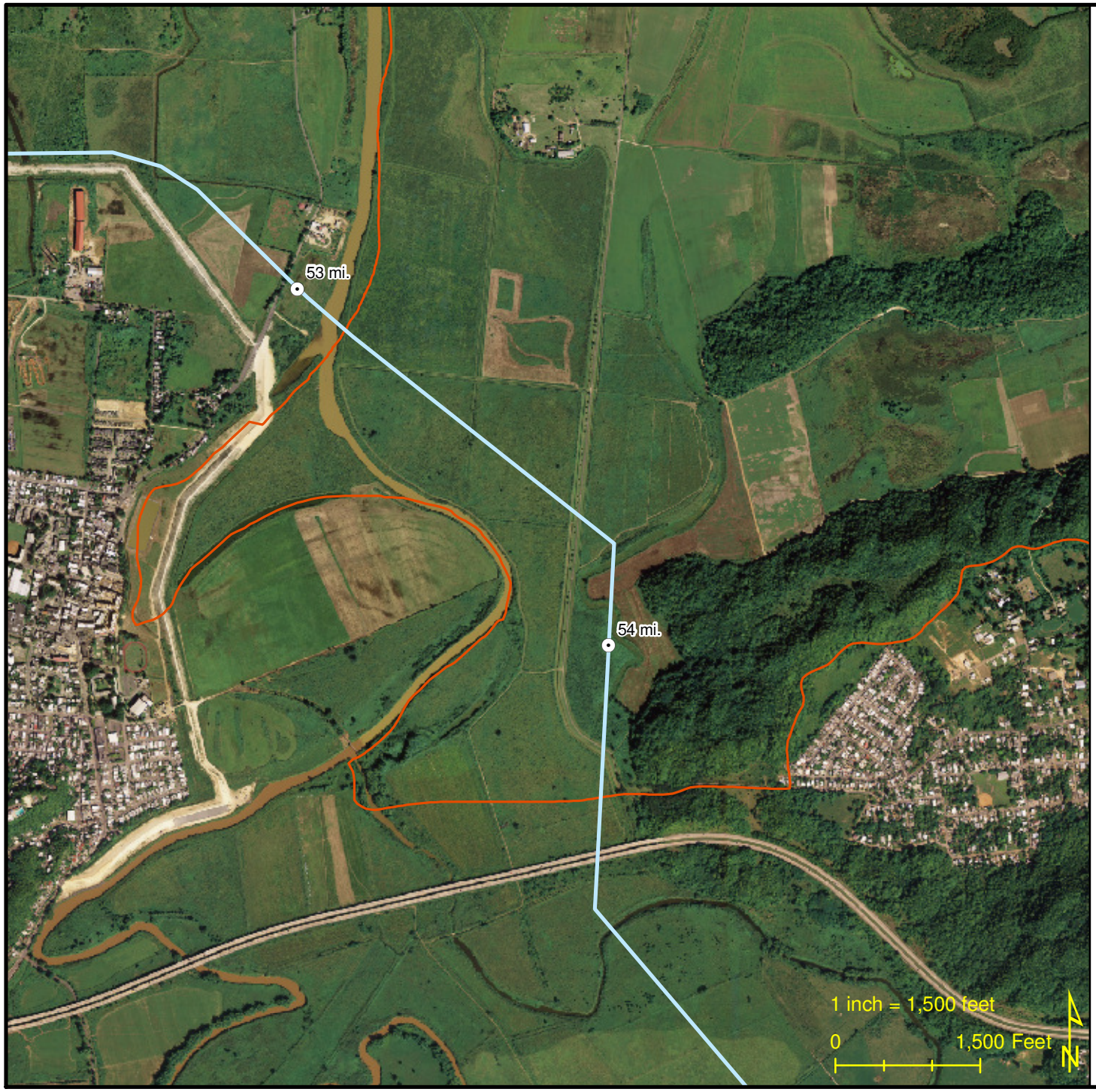


Via Verde Pipeline Project

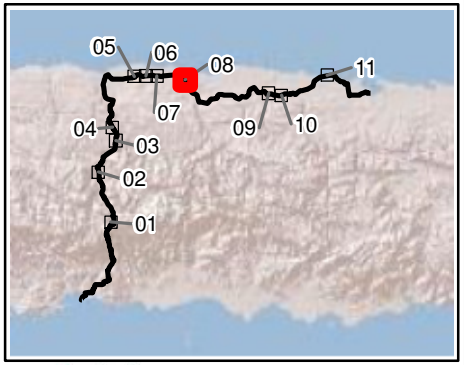
Ecoelectrica LNG Terminal to San Juan Power Plant

Critical Habitat Wildlife Elements

Map 08

- Mile Marker
- Pipeline
- Critical Habitat

Element Occurences



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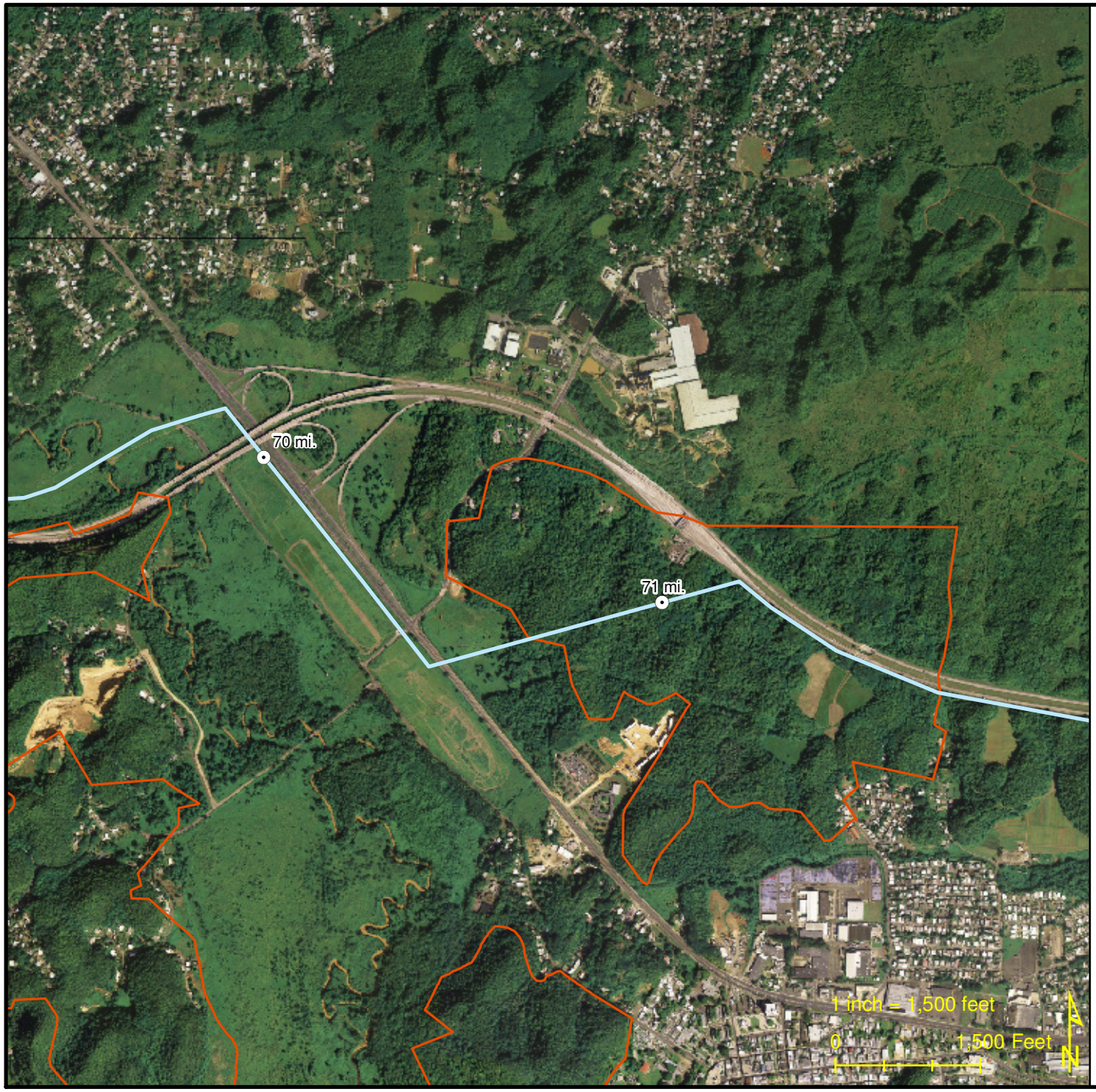


Via Verde Pipeline Project

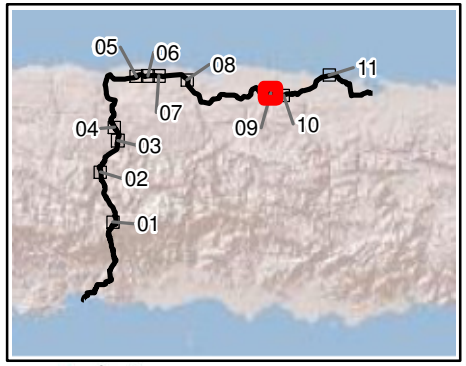
Ecoelectrica LNG Terminal to San Juan Power Plant

Critical Habitat Wildlife Elements

Map 09

- Mile Marker
- Pipeline
- Critical Habitat

Element Occurences



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Date: Aug 27, 2010

Via Verde Pipeline Project

Ecoelectrica LNG Terminal to San Juan Power Plant

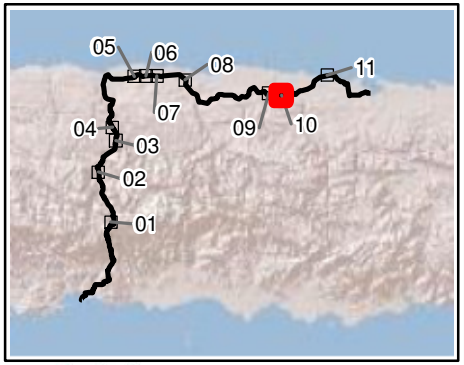
Critical Habitat Wildlife Elements

Map 10

- Mile Marker
- Pipeline
- Critical Habitat

Element Occurences

- TOURNEFORTIA FILIFLORA



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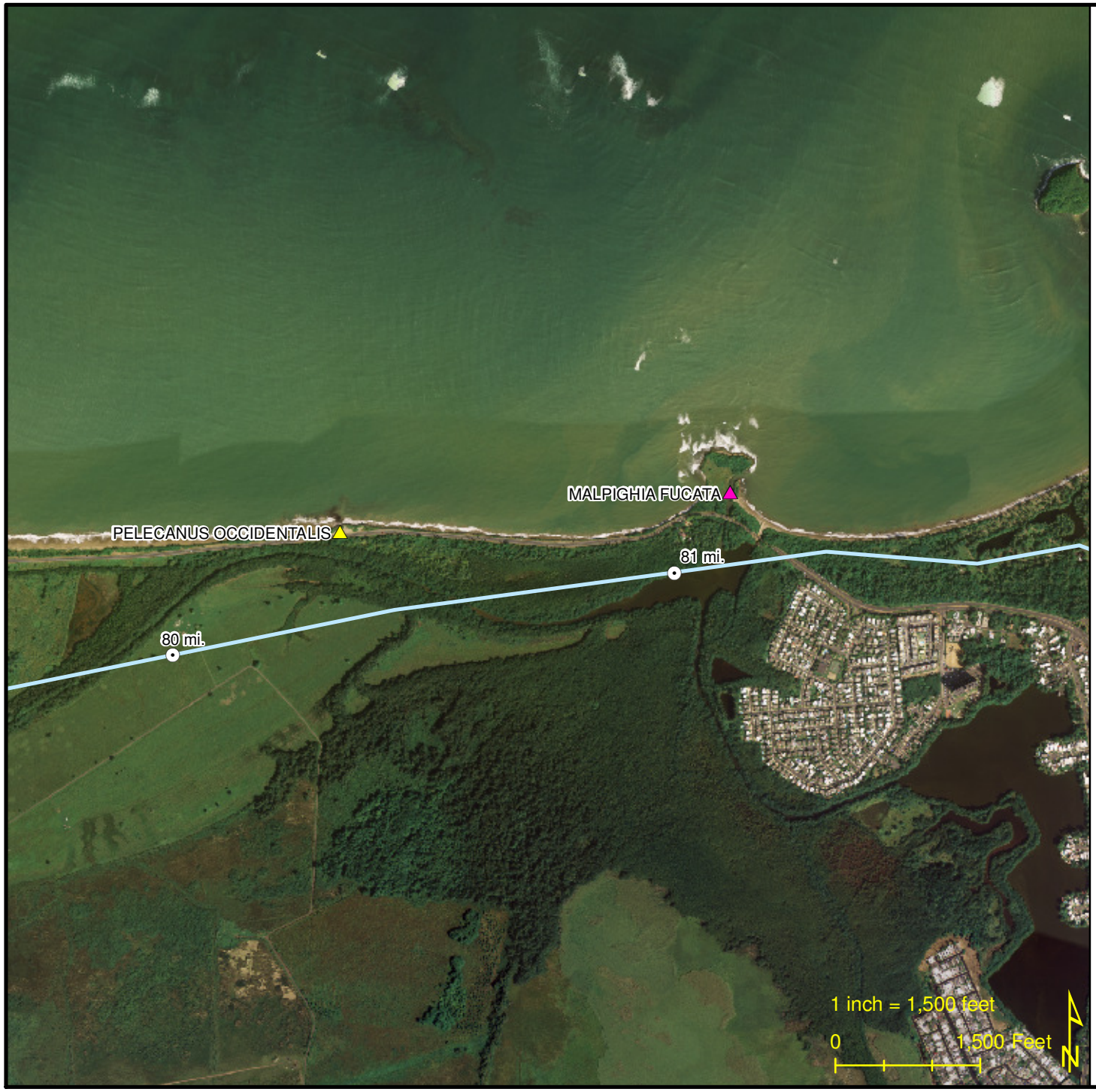


Via Verde Pipeline Project

Ecoelectrica LNG Terminal to San Juan Power Plant

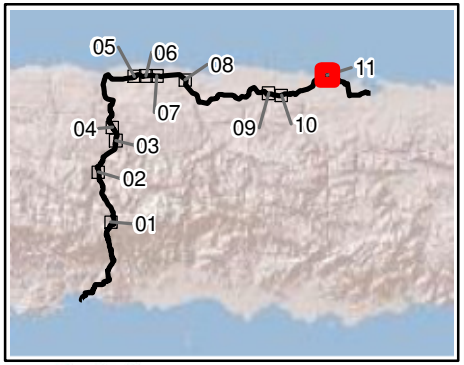
Critical Habitat Wildlife Elements

Map 11

- Mile Marker
- Pipeline
- Critical Habitat

Element Occurences

- MALPIGHIA FUCATA
- PELECANUS OCCIDENTALIS



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